

C L A I M S

1. A transmission power control method characterized in that:

5 reception quality of a signal transmitted from a remote station is compared with a control target value, and the comparison result is used for transmission power control on the remote station; and

10 it is checked whether a frame error exists in the received signal, the control target value is increased if a frame error is detected, and the control target value is gradually decreased if no frame error is detected.

2. A transmission control method characterized in that:

15 a channel is established between a mobile station and a base station, reception quality of a signal transmitted from the base station is compared with a control target value in the mobile station, and the comparison result is used for transmission power control on the base station; and

20 the mobile station checks whether a frame error exists in the received signal, increases the control target value if a frame error is detected, and gradually decreases the control target value if no frame error is detected.

25 3. A transmission control method characterized in that:

a channel is established between a mobile station and a base station, reception quality of a signal transmitted from the mobile station is compared with a control target value in the base station, and the comparison result is 5 used for transmission power control on the mobile station; and

the base station checks whether a frame error exists in the received signal, increases the control target value if a frame error is detected, and gradually decreases the 10 control target value if no frame error is detected.

4. A transmission power control method characterized in that:

diversity synthesis of signals transmitted from one or a plurality of remote stations is performed, reception 15 quality of a synthesized signal is compared with a control target value, and the comparison result is used for transmission power control on the one or the plurality of remote stations; and

it is checked whether a frame error exists in the 20 synthesized signal, the control target value is increased if a frame error is detected, and the control target value is gradually decreased if no frame error is detected.

5. A transmission power control method characterized in that:

25 a channel is established between a mobile station and

one or a plurality of base stations, the mobile station performs diversity synthesis of signals transmitted from one or a plurality of base stations, reception quality of a synthesized signal is compared with a control target value, and the comparison result is used for transmission power control on the one or the plurality of base stations; and

the mobile station checks whether a frame error exists in the received signal, increases the control target value if a frame error is detected, and gradually decreases the control target value if no frame error is detected.

6. A transmission power control method characterized in that:

a channel is established between a mobile station and one or a plurality of base stations, reception quality of a signal transmitted from the mobile station is compared with a control target value in the one or the plurality of base stations, and the comparison result is used for transmission power control on the mobile station;

each of the one or the plurality of base stations checks whether a frame error exists in the signal, and notifies a control station of the check result; and

the control station uses the check result to determine the presence/absence of a frame in which no

error is detected, increases the control target value if the determination result indicates that there is no frame in which no error is detected, gradually decreases the control target value if the determination result indicates 5 that there is a frame in which no error is detected, and notifies each of the one or the plurality of base stations of the control target value after updating.

7. A transmission power control method characterized in that:

10 a channel is established between a mobile station and one or a plurality of base stations, reception quality of a signal transmitted from the mobile station is compared with a control target value in the one or the plurality of base stations, and the comparison result is used for 15 transmission power control on the mobile station;

each of the one or the plurality of base stations checks whether a frame error exists in the signal, and notifies a control station of the check result;

the control station uses the check result to 20 determine the presence/absence of a frame in which no error is detected, and notifies each of the one and the plurality of base stations of the determination result; and

each of the one or the plurality of base stations 25 increases the control target value if the notified

determination result indicates that there is no frame in which no error is detected, and gradually decreases the control target value if the determination result indicates that there is a frame in which no error is detected.

5 8. A transmission power control method characterized in that:

10 a channel is established between a mobile station and one or a plurality of base stations, reception quality of a signal transmitted from the mobile station is compared with a control target value in the one or the plurality of base stations, and the comparison result is used for transmission power control on the mobile station;

15 each of the one or the plurality of base stations checks whether a frame error exists in the signal, and notifies a control station of the check result;

20 the control station determines, on the basis of the check result, the presence/absence of a frame in which no error is detected, and if there is no frame in which no error is detected, notifies each of the one or the plurality of base stations of the determination result; and

25 each of the one or the plurality of base stations increases the control target value if it is notified of the determination result, and gradually decreases the control target value if it is not notified of the

determination result.

9. A transmission power control method characterized in that:

5 a channel is established between a mobile station and one or a plurality of base stations, reception quality of a signal transmitted from the mobile station is compared with a control target value in the one or the plurality of base stations, and the comparison result is used for transmission power control on the mobile station;

10 each of the one or the plurality of base stations checks whether a frame error exists in the signal, and notifies a control station of the check result;

15 the control station notifies the one or the plurality of base stations of all check results notified from the one or the plurality of base stations or all check results except for a check result from a self-station; and

20 each of the one or the plurality of base stations determines, on the basis of the check result, the presence/absence of a frame in which no error is detected, increases the control target value if there is no frame in which no error is detected, and gradually decreases the control target value if there is a frame in which no error is detected.

10. A transmission power control method characterized in that:

a channel is established between a mobile station and one or a plurality of base stations, reception quality of a signal transmitted from the mobile station is compared with a control target value in the one or the plurality of 5 base stations, and the comparison result is used for transmission power control on the mobile station; and

a control station performs diversity synthesis of signals received from the one or the plurality of base stations, checks whether a frame error exists in a 10 synthesized signal, increases the control target value if a frame error is detected, and gradually decreases the control target value if no frame error is detected.

11. A transmission power control method characterized in that:

15 a channel is established between a mobile station and one or a plurality of base stations, reception quality of a signal transmitted from the mobile station is compared with a control target value in the one or the plurality of base stations, and the comparison result is used for 20 transmission power control on the mobile station;

each of the one or the plurality of base stations sends a signal received from the mobile station to a control station;

the control station performs diversity synthesis of 25 reception signals sent from the respective base stations,

checks whether a frame error exists in the synthesized signal, and notifies each of the one or the plurality of base stations of the check result; and

each of the one or the plurality of base stations  
5 increases the control target value if the check result indicates that a frame error is detected, and gradually decreases the control target value if no frame error is detected.

12. A transmission power control method characterized in  
10 that:

a channel is established between a mobile station and one or a plurality of base stations, reception quality of a signal transmitted from the mobile station is compared with a control target value in the one or the plurality of  
15 base stations, and the comparison result is used for transmission power control on the mobile station;

each of the one or the plurality of base stations sends a signal received from the mobile station to a control station;

20 the control station performs diversity synthesis of reception signals sent from each of the one or the plurality of base stations, checks whether a frame error exists in the synthesized signal, and if a frame error is detected, notifies each of the one or the plurality of  
25 base stations of the result; and

each of the one or the plurality of base stations increases the control target value if the notification is received, and gradually decreases the control target value if the notification is not received.

5 13. A transmission power control method according to any one of claims 1 to 12, characterized in that:

if a frame error is detected, the control target value is increased; and

10 if no frame error is detected, the control target value is gradually decreased to match channel quality to a channel quality target value.

14. A transmission power control method according to any one of claims 1 to 12, characterized in that:

if a frame error is detected, the control target value is increased; and

if no frame error is detected, the control target value is gradually decreased to match a frame error rate to a channel quality target value.

15. A transmission power control method according to any 20 one of claims 1 to 12, characterized in that

if a frame error is detected, the control target value is increased by a first predetermined value; and

if no frame error is detected, the control target value is gradually decreased such that the control target 25 value is decreased by the first predetermined value in an

average time during which a frame error is detected when a frame error rate is set to a desired value.

16. A transmission power control method according to any one of claims 1 to 12, characterized in that:

5 if a frame error is detected, the control target value is increased by a first predetermined value; and

if no frame error is detected, the control target value is gradually decreased such that the control target value is decreased by the first predetermined value while 10 frames fewer than a reciprocal of a channel quality target value based on a frame error rate by one are received.

17. A transmission power control method according to any one of claims 1 to 12, characterized in that:

if a frame error is detected, the control target value is increased by a first predetermined value, and if 15 no frame error is detected, the control target value is decreased by a second predetermined value; and

a ratio of the first predetermined value to the second predetermined value is determined in accordance 20 with a channel quality target value.

18. A transmission power control method according to any one of claims 1 to 12, characterized in that:

if a frame error is detected, the control target value is increased by a first predetermined value, and if 25 no frame error is detected, the control target value is

decreased by a second predetermined value; and  
a ratio of the first predetermined value to the  
second predetermined value is determined in accordance  
with a channel quality target value based on a frame error  
5 rate.

19. A transmission power control method according to any  
one of claims 1 to 12, characterized in that:  
if a frame error is detected, the control target  
value is increased by a first predetermined value, and if  
10 no frame error is detected, the control target value is  
decreased by a second predetermined value; and  
a ratio of the first predetermined value to the  
second predetermined value is set to a reciprocal of a  
channel quality target value based on a frame error rate.

15 20. A transmission power control method according to any  
one of claims 1 to 12, characterized in that:  
if a frame error is detected, the control target  
value is increased by a first predetermined value, and if  
no frame error is detected, the control target value is  
20 decreased by a second predetermined value; and  
a ratio of the first predetermined value to the  
second predetermined value is set to a value smaller than  
a reciprocal of a channel quality target value based on a  
frame error rate by one.

25 21. A transmission power control method according to any

one of claims 1 to 12, characterized in that:

if a frame error is detected, the control target value is increased by a first predetermined value, and if no frame error is detected, the control target value is 5 decreased by a second predetermined value; and

a product of a channel quality target value based on a frame error rate and the first predetermined value is set as the second predetermined value.

22. A transmission power control method according to any 10 one of claims 1 to 12, characterized in that:

if a frame error is detected, the control target value is increased by a first predetermined value, and if no frame error is detected, the control target value is decreased by a second predetermined value; and

15 a product of a channel quality target value based on a frame error rate and the first predetermined value is equal to a product of a value smaller than one by a channel quality target value based on a frame error rate and the second predetermined value.

20 23. A transmission power control apparatus characterized in that:

reception quality of a signal transmitted from a remote station is compared with a control target value, and the comparison result is used for transmission power 25 control on the remote station; and

it is checked whether a frame error exists in the signal, the control target value is increased if a frame error is detected, and the control target value is gradually decreased if no frame error is detected.

5 24. A transmission power control apparatus characterized in that:

diversity synthesis of signals transmitted from a plurality of remote stations is performed, reception quality of a synthesized signal is compared with a control 10 target value, and the comparison result is used for transmission power control on the plurality of remote stations; and

it is checked whether a frame error exists in the synthesized signal, the control target value is increased 15 if a frame error is detected, and the control target value is gradually decreased if no frame error is detected.

25. A transmission power control apparatus according to a claim 23 or 24, characterized in that:

if a frame error is detected, the control target 20 value is increased, and

if no frame error is detected, the control target value is gradually decreased to match channel quality to a channel quality target value.

26. A transmission power control apparatus according to 25 a claim 23 or 24, characterized in that:

if a frame error is detected, the control target value is increased; and

if no frame error is detected, the control target value is gradually decreased to match a frame error rate 5 to a channel quality target value.

27. A transmission power control apparatus according to a claim 23 or 24, characterized in that:

if a frame error is detected, the control target value is increased by a first predetermined value, and

10 if no frame error is detected, the control target value is gradually decreased such that the control target value is decreased by the first predetermined value in an average time during which a frame error is detected when a frame error rate is set to a desired value.

15 28. A transmission power control apparatus according to a claim 23 or 24, characterized in that:

if a frame error is detected, the control target value is increased by a first predetermined value; and

20 if no frame error is detected, the control target value is gradually decreased such that the control target value is decreased by the first predetermined value while frames fewer than a reciprocal of a channel quality target value based on a frame error rate by one are received.

25 29. A transmission power control apparatus according to a claim 23 or 24, characterized in that:

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if a frame error is detected, the control target value is increased by a first predetermined value, and if no frame error is detected, the control target value is decreased by a second predetermined value; and

5        a ratio of the first predetermined value to the second predetermined value is determined in accordance with a channel quality target value.

30. A transmission power control apparatus according to a claim 23 or 24, characterized in that:

10        if a frame error is detected, the control target value is increased by a first predetermined value, and if no frame error is detected, the control target value is decreased by a second predetermined value; and

15        a ratio of the first predetermined value to the second predetermined value is determined in accordance with a channel quality target value based on a frame error rate.

31. A transmission power control apparatus according to a claim 23 or 24, characterized in that:

20        if a frame error is detected, the control target value is increased by a first predetermined value, and if no frame error is detected, the control target value is decreased by a second predetermined value; and

25        a ratio of the first predetermined value to the second predetermined value is set to a reciprocal of a

channel quality target value based on a frame error rate.

32. A transmission power control apparatus according to a claim 23 or 24, characterized in that:

if a frame error is detected, the control target value is increased by a first predetermined value, and if no frame error is detected, the control target value is decreased by a second predetermined value; and

10 a ratio of the first predetermined value to the second predetermined value is set to a value smaller than a reciprocal of a channel quality target value based on a frame error rate by one.

33. A transmission power control apparatus according to a claim 23 or 24, characterized in that:

15 if a frame error is detected, the control target value is increased by a first predetermined value, and if no frame error is detected, the control target value is decreased by a second predetermined value; and

20 a product of a channel quality target value based on a frame error rate and the first predetermined value is set as the second predetermined value.

34. A transmission power control apparatus according to a claim 23 or 24, characterized in that:

if a frame error is detected, the control target value is increased by a first predetermined value, and if no frame error is detected, the control target value is

decreased by a second predetermined value; and

a product of a channel quality target value based on a frame error rate and the first predetermined value is equal to a product of a value smaller than one by a 5 channel quality target value based on a frame error rate and the second predetermined value.

35. A mobile station characterized in that:

reception quality of a signal transmitted from a base station is compared with a control target value, and the 10 comparison result is used for transmission power control on the base station; and

it is checked whether a frame error exists in the signal, the control target value is increased if a frame error is detected, and the control target value is 15 gradually decreased if no frame error is detected.

36. A mobile station characterized in that:

diversity synthesis of signals transmitted from one or a plurality of base stations is performed, reception quality of a synthesized signal is compared with a control 20 target value, and the comparison result is used for transmission power control on the one or the plurality of base stations; and

it is checked whether a frame error exists in the synthesized signal, the control target value is increased 25 if a frame error is detected, and the control target value

is gradually decreased if no frame error is detected.

37. A mobile station according to a claim 35 or 36, characterized in that if a frame error is detected, the control target value is increased, and if no frame error  
5 is detected, the control target value is gradually decreased to match channel quality to a channel quality target value.

38. A mobile station according to a claim 35 or 36, characterized in that:

10 if a frame error is detected, the control target value is increased, and

if no frame error is detected, the control target value is gradually decreased to match a frame error rate to a channel quality target value.

15 39. A mobile station according to a claim 35 or 36, characterized in that:

if a frame error is detected, the control target value is increased by a first predetermined value; and

20 if no frame error is detected, the control target value is gradually decreased such that the control target value is decreased by the first predetermined value in an average time during which a frame error is detected when a frame error rate is set to a desired value.

40. A mobile station according to a claim 35 or 36,  
25 characterized in that:

if a frame error is detected, the control target value is increased by a first predetermined value; and

5 if no frame error is detected, the control target value is gradually decreased such that the control target value is decreased by the first predetermined value while frames fewer than a reciprocal of a channel quality target value based on a frame error rate by one are received.

41. A mobile station according to a claim 35 or 36, characterized in that:

10 if a frame error is detected, the control target value is increased by a first predetermined value, and if no frame error is detected, the control target value is decreased by a second predetermined value; and

15 a ratio of the first predetermined value to the second predetermined value is determined in accordance with a channel quality target value.

42. A mobile station according to a claim 35 or 36, characterized in that:

20 if a frame error is detected, the control target value is increased by a first predetermined value, and if no frame error is detected, the control target value is decreased by a second predetermined value; and

25 a ratio of the first predetermined value to the second predetermined value is determined in accordance with a channel quality target value based on a frame error

rate.

43. A mobile station according to a claim 35 or 36, characterized in that:

if a frame error is detected, the control target value is increased by a first predetermined value, and if no frame error is detected, the control target value is decreased by a second predetermined value; and

10 a ratio of the first predetermined value to the second predetermined value is set to a reciprocal of a channel quality target value based on a frame error rate.

44. A mobile station according to a claim 35 or 36, characterized in that:

if a frame error is detected, the control target value is increased by a first predetermined value, and if no frame error is detected, the control target value is decreased by a second predetermined value; and

15 a ratio of the first predetermined value to the second predetermined value is set to a value smaller than a reciprocal of a channel quality target value based on a frame error rate by one.

45. A mobile station according to a claim 35 or 36, characterized in that:

if a frame error is detected, the control target value is increased by a first predetermined value, and if no frame error is detected, the control target value is

decreased by a second predetermined value; and

a product of a channel quality target value based on a frame error rate and the first predetermined value is set as the second predetermined value.

5 46. A mobile station according to a claim 35 or 36, characterized in that:

if a frame error is detected, the control target value is increased by a first predetermined value, and if no frame error is detected, the control target value is

10 decreased by a second predetermined value; and

a product of a channel quality target value based on a frame error rate and the first predetermined value is equal to a product of a value smaller than one by a channel quality target value based on a frame error rate

15 and the second predetermined value.

47. A base station characterized in that:

reception quality of a signal transmitted from a mobile station is compared with a control target value, and the comparison result is used for transmission power

20 control on the mobile station; and

it is checked whether a frame error exists in the signal, the control target value is increased if a frame error is detected, and the control target value is gradually decreased if no frame error is detected.

25 48. A base station characterized in that:

reception quality of a signal transmitted from a mobile station is compared with a control target value, and the comparison result is used for transmission power control on the mobile station;

5 it is checked whether a frame error exists in the signal, and a control station is notified of the check result; and

the control station uses the check result to determine the presence/absence of a frame in which no 10 error is detected, increases the control target value if there is no frame in which no error is detected, and gradually decreases the control target value if there is a frame in which no error is detected.

49. A base station characterized in that:

15 reception quality of a signal transmitted from a mobile station is compared with a control target value, and the comparison result is used for transmission power control on the mobile station;

it is checked whether a frame error exists in the 20 signal, and a control station is notified of the check result; and

a determination result on the presence/absence of a frame in which no error is detected, which is based on the check result, is received from the control station, the 25 control target value is increased if the determination

result indicates that there is no frame in which no error is detected, and the control target value is gradually decreased if the determination result indicates that there is a frame in which no error is detected.

5 50. A base station characterized in that:

reception quality of a signal transmitted from a mobile station is compared with a control target value, and the comparison result is used for transmission power control on the mobile station;

10 it is checked whether a frame error exists in the signal, and a control station is notified of the check result; and

15 a determination result indicating that there is no frame in which no error is detected is received from the control station; and

the control target value is increased if the base station is notified of the determination result, and the control target value is gradually decreased if the base station is not notified of the determination result.

20 51. A base station characterized in that:

reception quality of a signal transmitted from a mobile station is compared with a control target value, and the comparison result is used for transmission power control on the mobile station;

25 it is checked whether a frame error exists in the

signal, and a control station is notified of the check result;

all check results from the one or the plurality of base stations or all check results except for a check 5 result from the self-station are received from the control station; and

the presence/absence of a frame in which no error is detected is determined on the basis of the check results, the control target value is increased if there is no frame 10 in which no error is detected, and the control target value is gradually decreased if there is a frame in which no error is detected.

52. A base station characterized in that:

reception quality of a signal transmitted from a 15 mobile station is compared with a control target value, and the comparison result is used for transmission power control on the mobile station;

the signal received from the mobile station is sent to a control station; and

20 the control station checks whether a frame error exists in a signal obtained by diversity synthesis of reception signals sent from one or a plurality of base stations, the control target value is increased if a frame error is detected, the control target value is gradually 25 decreased if no frame error is detected, and the updated

control target value is received from the control station.

53. A base station characterized in that:

reception quality of a signal transmitted from a mobile station is compared with a control target value, 5 and the comparison result is used for transmission power control on the mobile station;

the signal received from the mobile station is sent to a control station;

10 the control station checks whether a frame error exists in a signal obtained by diversity synthesis of reception signals sent from one or a plurality of base stations, and the check result is received from the control station; and

15 the control target value is increased if the check result indicates that a frame error is detected, and the control target value is gradually decreased if the check result indicates that no frame error is detected.

54. A base station characterized in that:

20 reception quality of a signal transmitted from a mobile station is compared with a control target value, and the comparison result is used for transmission power control on the mobile station;

the signal received from the mobile station is sent to a control station;

25 the control station checks whether a frame error

exists in a signal obtained by diversity synthesis of reception signals sent from one or a plurality of base stations, and a notification indicating that a frame error is detected is received from the control station; and

5       the control target value is increased if the notification is received, and the control target value is gradually decreased if the notification is not received.

55. A base station according to any one of claims 47 to 54, characterized in that:

10       if a frame error is detected, the control target value is increased; and

      if no frame error is detected, the control target value is gradually decreased to match channel quality to a channel quality target value.

15       56. A base station according to any one of claims 47 to 54, characterized in that:

      if a frame error is detected, the control target value is increased; and

20       if no frame error is detected, the control target value is gradually decreased to match a frame error rate to a channel quality target value.

57. A base station according to any one of claims 47 to 54, characterized in that:

25       if a frame error is detected, the control target value is increased by a first predetermined value; and

if no frame error is detected, the control target value is gradually decreased such that the control target value is decreased by the first predetermined value in an average time during which a frame error is detected when a 5 frame error rate is set to a desired value.

57. A base station according to any one of claims 47 to 54, characterized in that:

if a frame error is detected, the control target value is increased by a first predetermined value; and

10 if no frame error is detected, the control target value is gradually decreased such that the control target value is decreased by the first predetermined value while frames fewer than a reciprocal of a channel quality target value based on a frame error rate by one are received.

15 59. A base station according to any one of claims 47 to 54, characterized in that:

if a frame error is detected, the control target value is increased by a first predetermined value, and if no frame error is detected, the control target value is 20 decreased by a second predetermined value; and

a ratio of the first predetermined value to the second predetermined value is determined in accordance with a channel quality target value.

60. A base station according to any one of claims 47 to 25 54, characterized in that:

if a frame error is detected, the control target value is increased by a first predetermined value, and if no frame error is detected, the control target value is decreased by a second predetermined value; and

5       a ratio of the first predetermined value to the second predetermined value is determined in accordance with a channel quality target value based on a frame error rate.

61. A base station according to any one of claims 47 to  
10 54, characterized in that:

if a frame error is detected, the control target value is increased by a first predetermined value, and if no frame error is detected, the control target value is decreased by a second predetermined value; and

15       a ratio of the first predetermined value to the second predetermined value is set to a reciprocal of a channel quality target value based on a frame error rate.

62. A base station according to any one of claims 47 to  
54, characterized in that:

20       if a frame error is detected, the control target value is increased by a first predetermined value, and if no frame error is detected, the control target value is decreased by a second predetermined value; and

25       a ratio of the first predetermined value to the second predetermined value is set to a value smaller than

a reciprocal of a channel quality target value based on a frame error rate by one.

63. A base station according to any one of claims 47 to 54, characterized in that:

5 if a frame error is detected, the control target value is increased by a first predetermined value, and if no frame error is detected, the control target value is decreased by a second predetermined value; and

10 a product of a channel quality target value based on a frame error rate and the first predetermined value is set as the second predetermined value.

64. A base station according to any one of claims 47 to 54, characterized in that:

15 if a frame error is detected, the control target value is increased by a first predetermined value, and if no frame error is detected, the control target value is decreased by a second predetermined value; and

20 a product of a channel quality target value based on a frame error rate and the first predetermined value is equal to a product of a value smaller than one by a channel quality target value based on a frame error rate and the second predetermined value.

65. A control station characterized in that:

25 a check result indicating whether a frame error exists in a signal transmitted from a mobile station to

one or a plurality of base stations is received from each of the one or the plurality of base stations; and

the presence/absence of a frame in which no error is detected is determined on the basis of the check result, a 5 control target value for controlling transmission power of the mobile station in the one or the plurality of base stations is increased if there is no frame in which no error is detected, and the control target value is gradually decreased if there is a frame in which no error 10 is detected.

66. A control station characterized in that:

a check result indicating whether a frame error exists in a signal transmitted from a mobile station to one or a plurality of base stations is received from each 15 of the one or the plurality of base stations; and

the presence/absence of a frame in which no error is detected is determined on the basis of the check result, and the one or the plurality of base stations is notified of the determination result to increase a control target 20 value for controlling transmission power of the mobile station in the one or the plurality of base stations if there is no frame in which no error is detected, and to gradually decrease the control target value if there is a frame in which no error is detected.

25 67. A control station characterized in that:

a check result indicating whether a frame error exists in a signal transmitted from a mobile station to one or a plurality of base stations is received from each of the one or the plurality of base stations;

5       the presence/absence of a frame in which no error is detected is determined on the basis of the check result, and if there is no frame in which no error is detected, each of the one or the plurality of base stations is notified of the determination result, and

10      a control target value for controlling transmission power of the mobile station is increased if each of the one or the plurality of base stations is notified of the determination result, and the control target value is gradually decreased if the base station is not notified of

15      the determination result.

68. A control station characterized in that:

      a check result indicating whether a frame error exists in a signal transmitted from a mobile station to one or a plurality of base stations is received from each of the one or the plurality of base stations;

20      each of the one or the plurality of base stations is notified of all check results sent from the one or the plurality of base stations or all check results except for a check result from the self-station; and

25      each of the one or the plurality of base stations is

made to determine on the basis of the check result the presence/absence of a frame in which no error is detected, increase a control target value for controlling transmission power of the mobile station if there is no 5 frame in which no error is detected, and gradually decrease the control target value if there is a frame in which no error is detected.

69. A control station characterized in that:

diversity synthesis of signals from a mobile station 10 received by one or a plurality of base stations is performed; and

it is checked whether a frame error exists in the synthesized signal, a control target value for controlling transmission power of the mobile station in the one or the 15 plurality of base stations is increased if a frame error is detected, and the control target value is gradually decreased if no frame error is detected.

70. A control station characterized in that:

signals from a mobile station are received by one or 20 a plurality of base stations;

diversity synthesis of reception signals sent from the one or the plurality of base stations is performed, it is checked whether a frame error exists in the synthesized signal, and the one or the plurality of base stations is 25 notified of the check result; and

a control target value for controlling transmission power of the mobile station which each of the one or the plurality of base stations has is increased if the check result indicates that a frame error is detected, and the 5 control target value is gradually decreased if no frame error is detected.

71. A control station characterized in that:

signals from a mobile station are received by one or a plurality of base stations;

10 diversity synthesis of reception signals sent from the one or the plurality of base stations is performed, it is checked whether a frame error exists in the synthesized signal, and if a frame error is detected, the one or the plurality of base stations is notified of the result; and

15 a control target value for controlling transmission power of the mobile station which each of the one or the plurality of base stations has is increased if the notification is received, and the control target value is gradually decreased if the notification is not received.

20 72. A control station according to any one of claims 65 to 71, characterized in that:

if a frame error is detected, the control target value is increased; and

25 if no frame error is detected, the control target value is gradually decreased to match channel quality to a

channel quality target value.

73. A control station according to any one of claims 65 to 71, characterized in that:

if a frame error is detected, the control target  
5 value is increased; and

if no frame error is detected, the control target value is gradually decreased to match a frame error rate to a channel quality target value.

74. A control station according to any one of claims 65  
10 to 71, characterized in that:

if a frame error is detected, the control target value is increased by a first predetermined value; and

if no frame error is detected, the control target value is gradually decreased such that the control target  
15 value is decreased by the first predetermined value in an average time during which a frame error is detected when a frame error rate is set to a desired value.

75. A control station according to any one of claims 65 to 71, characterized in that:

20 if a frame error is detected, the control target value is increased by a first predetermined value; and

if no frame error is detected, the control target value is gradually decreased such that the control target value is decreased by the first predetermined value while  
25 frames fewer than a reciprocal of a channel quality target

value based on a frame error rate by one are received.

76. A control station according to any one of claims 65 to 71, characterized in that:

if a frame error is detected, the control target value is increased by a first predetermined value, and if no frame error is detected, the control target value is decreased by a second predetermined value; and

a ratio of the first predetermined value to the second predetermined value is determined in accordance 10 with a channel quality target value.

77. A control station according to any one of claims 65 to 71, characterized in that:

if a frame error is detected, the control target value is increased by a first predetermined value, and if 15 no frame error is detected, the control target value is decreased by a second predetermined value; and

a ratio of the first predetermined value to the second predetermined value is determined in accordance with a channel quality target value based on a frame error 20 rate.

78. A control station according to any one of claims 65 to 71, characterized in that:

if a frame error is detected, the control target value is increased by a first predetermined value, and if 25 no frame error is detected, the control target value is

decreased by a second predetermined value; and

a ratio of the first predetermined value to the second predetermined value is set to a reciprocal of a channel quality target value based on a frame error rate.

5 79. A control station according to any one of claims 65 to 71, characterized in that:

if a frame error is detected, the control target value is increased by a first predetermined value, and if no frame error is detected, the control target value is 10 decreased by a second predetermined value; and

a ratio of the first predetermined value to the second predetermined value is set to a value smaller than a reciprocal of a channel quality target value based on a frame error rate by one.

15 80. A control station according to any one of claims 65 to 71, characterized in that:

if a frame error is detected, the control target value is increased by a first predetermined value, and if no frame error is detected, the control target value is 20 decreased by a second predetermined value; and

a product of a channel quality target value based on a frame error rate and the first predetermined value is set as the second predetermined value.

81. A control station according to any one of claims 65 25 to 71, characterized in that:

if a frame error is detected, the control target value is increased by a first predetermined value, and if no frame error is detected, the control target value is decreased by a second predetermined value; and

5 a product of a channel quality target value based on a frame error rate and the first predetermined value is equal to a product of a value smaller than one by a channel quality target value based on a frame error rate and the second predetermined value.

10 82. A transmission power control method characterized in that:

a signal-to-interference ratio of a signal transmitted from a remote station is compared with a signal-to-interference ratio reference value, every time a 15 slot is received, and a control instruction is generated and transmitted to the remote station;

the remote station updates, every time a control instruction is received, transmission power in accordance with the control instruction, and every time a frame 20 containing error detection information is received from the remote station, it is checked whether a frame error exists in the signal; and

the signal-to-interference ratio reference value is increased by SIRinc if a frame error is detected, the 25 signal-to-interference ratio reference value is decreased

by SIRdec if no frame error is detected, and a product of a target value of a frame error rate and SIRinc is set as SIRdec.

83. A transmission power control method characterized in 5 that:

a signal-to-interference ratio of a signal transmitted from a remote station is compared with a signal-to-interference ratio reference value, every time a slot is received, and a control instruction is generated 10 and transmitted to the remote station;

the remote station updates, every time a control instruction is received, transmission power in accordance with the control instruction, and every time a frame containing error detection information is received from 15 the remote station, it is checked whether a frame error exists in the signal; and

the signal-to-interference ratio reference value is increased by SIRinc if a frame error is detected, the signal-to-interference ratio reference value is decreased 20 by SIRdec if no frame error is detected, and a product of a ratio of a target value of a frame error rate to a value smaller than the target value of the frame error rate by one and SIRinc is set as SIRdec.

84. A transmission power control method according to a 25 claim 82 or 83, characterized in that upper and lower

limits are set in a range in which the signal-to-interference ratio reference value is changed.

85. A transmission power control method according to claim 82 or 83, characterized in that error detection 5 information is a Cyclic Redundancy Check code.

86. A transmission power control apparatus characterized in that:

a signal-to-interference ratio of a signal transmitted from a remote station is compared with a 10 signal-to-interference ratio reference value, every time a slot is received, and a control instruction is generated and transmitted to the remote station;

every time a frame containing error detection information is received from the remote station, it is 15 checked whether a frame error exists in the signal; and

the signal-to-interference ratio reference value is increased by SIRinc if a frame error is detected, the signal-to-interference ratio reference value is decreased by SIRdec if no frame error is detected, and a product of 20 a target value of a frame error rate and SIRinc is set as SIRdec.

87. A transmission power control apparatus characterized in that:

a signal-to-interference ratio of a signal transmitted from a remote station is compared with a 25

signal-to-interference ratio reference value, every time a slot is received, and a control instruction is generated and transmitted to the remote station, and every time a frame containing error detection information is received 5 from the remote station, it is checked whether a frame error exists in the signal; and

the signal-to-interference ratio reference value is increased by SIRinc if a frame error is detected, the signal-to-interference ratio reference value is decreased 10 by SIRdec if no frame error is detected, and a product of a ratio of a target value of a frame error rate to a value smaller than the target value of the frame error rate by one and SIRinc is set as SIRdec.

88. A transmission power control apparatus according to 15 a claim 86 or 87, characterized in that upper and lower limits are set in a range in which the signal-to-interference ratio reference value is changed.

89. A transmission power control apparatus according to claim 86 or 87, characterized in that error detection 20 information is a Cyclic Redundancy Check code.

90. A transmission power control method characterized in that:

reception quality of a signal transmitted from a remote station is compared with a control target value, 25 the comparison result is used for transmission power

control on the remote station, and the number of bits in error is checked; and

the control target value is increased in accordance with the number of bits in error and decreased in  
5 accordance with the number of bits not in error.

91. A transmission power control method characterized in that:

reception quality of a signal transmitted from a mobile station is compared with a control target value,  
10 the comparison result is used for transmission power control on a base station, and the number of bits in error is checked; and

the control target value is increased in accordance with the number of bits in error and decreased in  
15 accordance with the number of bits not in error.

92. A transmission power control method characterized in that:

reception quality of a signal transmitted from a base station is compared with a control target value, the  
20 comparison result is used for transmission power control on a mobile station, and the number of bits in error is checked; and

the control target value is increased in accordance with the number of bits in error and decreased in  
25 accordance with the number of bits not in error.

93. A transmission power control apparatus characterized in that:

reception quality of a signal transmitted from a remote station is compared with a control target value,  
5 the comparison result is used for transmission power control on the remote station, and the number of bits in error is checked; and

the control target value is increased in accordance with the number of bits in error and decreased in  
10 accordance with the number of bits not in error.

94. A mobile station characterized in that:

reception quality of a signal transmitted from a base station is compared with a control target value, the comparison result is used for transmission power control  
15 on the base station, and the number of bits in error is checked, and

the control target value is increased in accordance with the number of bits in error and decreased in accordance with the number of bits not in error.

20 95. A base station characterized in that:

reception quality of a signal transmitted from a mobile station is compared with a control target value, the comparison result is used for transmission power control on the mobile station, and the number of bits in  
25 error is checked, and

the control target value is increased in accordance with the number of bits in error and decreased in accordance with the number of bits not in error.

96. A control station characterized in that:

5 diversity synthesis of signals from a mobile station which are received by a plurality of base stations, and the number of bits in error in the synthesized signal is checked, and

10 a control target value for controlling transmission power of the mobile station is increased in accordance with the number of bits in error and decreased in accordance with the number of bits not in error.

97. A transmission power control method in a mobile communication system, characterized in that:

15 reception quality of a transmitted signal is compared with a predetermined control target value, and the comparison result is used for transmission power control on a remote station; and

20 it is checked whether a frame error exist in the signal, the control target value is increased if a frame error is detected, and the control target value is decreased if no frame error is detected.

98. A transmission power control apparatus in a mobile communication system, characterized in that:

25 reception quality of a transmitted signal is compared

with a predetermined control target value, and the comparison result is used for transmission power control on a remote station; and

5 it is checked whether a frame error exist in the signal, the control target value is increased if a frame error is detected, and the control target value is decreased if no frame error is detected.